

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT: HSIAO, Cheng-Fang

SERIAL NO.: 10/688,185

ART UNIT: 2834

FILED: October 20, 2003

EXAMINER: Comas, Y.

TITLE: DIRECT CURRENT BRUSHLESS VIBRATION MOTOR

AMENDMENT "A"

Director of the U.S. Patent
and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In response to the Office Action of August 10, 2005, a response being due by November 10, 2005, please consider the following remarks:

REMARKS

Upon entry of the present amendments, previous Claim 1 has been canceled and new Claim 2 substituted therefor. Reconsideration of the rejections, in light of the forgoing amendments and present remarks, is respectfully requested. The present amendments have been entered for the purpose of distinguishing the present invention from the prior art.

In the Office Action, it was indicated that Claim 1 was rejected under 35 U.S.C. §102(b) as anticipated by the Hong publication.

As an overview to present reply, Applicant has extensively amended the language of original independent Claim 1 in the form of new independent Claim 2. New independent Claim 2 expresses the original limitations in a more proper U.S. format, including proper antecedent bases and proper structural interrelationships throughout. Any indefinite terminology found in the original claim language has been corrected herein.

In particular, new independent Claim 2 emphasizes the structure of the pole teeth and the rotor pole pairs. In particular, it is now stated that the stator has “an inner wall surrounding the annular slot”. The inner wall has “a series of pole teeth formed therein and facing toward the annular slot”. The rotor is now defined as having an “outer peripheral wall” facing the inner wall of the stator. The peripheral wall of the magnetic cylindrical body is indicated as having “a series of rotor pole pairs thereon”. This arrangement of the series of pole teeth and the rotor pole pairs is clearly distinguishable from the Hong publication and is not anticipated thereby.

The Hong publication does disclose a vibration motor. However, the structure of the Hong patent is quite different than that of the present invention. In particular, in order to create the rotary motion, the power supply lines 133 are connected to the plate 131. The plate 131 is positioned in proximity to the magnetic pole piece 112 so as to act on the rotor 120 therein. Unlike the present invention, the stator 110 does not have an annular slot formed centrally thereof so as to “entirely” surround the annular slot. In particular, in the Hong publication, the pole plates 116 extend upwardly from a periphery of a central hole thereof in generally spaced relationship to each other. Similarly, magnetic pole plates 115 are formed on another magnetic pole piece 111. The magnetic pole pieces 111 and 112 surround a bottom reel 113 into which is inserted a rotor. The purpose of these pole plates 115 and 116 was recited in paragraph [0024] of the Hong publication as follows:

The generated magnetic flux flows in the longitudinal direction of the generally cylindrical-shaped body of the stator 110 along the magnetic circuit inside the upper and lower magnetic pole pieces 111 and 112, which are located at both ends of the stator cylindrical body. The magnetic flux flows either into or out from the pole plates 115 and 116 of the pole pieces 111 and 112 respectively and then into or out from the rotor 120.

This is contrast to the construction of the present invention whereby the series of pole teeth are formed on the inner wall surrounding the annular slot of the stator and whereby the series of rotor pole pairs are formed on the peripheral wall of the magnetic cylindrical body so as to be in proximity to the series of pole teeth. As a result, rather than using the plate 131 of the Hong publication, the power supply lines of the present invention can be directly connected to the outer surface of the stator and through the outer wall of the housing. These features are neither shown nor suggested in the Hong publication.

It was an important feature of the present invention to construct the vibration motor in this manner so as to enhance the ability to produce the motor. As was stated in the "Background" section of the original specification in paragraph [0004]:

The conventional current vibration motor cannot be made easily and is not cost-effective. In addition, the rejection rate of the conventional direct current vibration motor is relatively high. The performance of the direct current vibration motor depends upon the assembly precision of the brush of the rectifier. A poor rectification is often resulted from a poor contact between the brush and the rectifier. In order to enhance the contact reliability and the wear resistance of the brush and the rectifier, the brush comprises a main body made of a precious metal, while the rectifier is provided of a cover made of a precious metal. As a result, the production of the conventional direct current motor is complicated. Accordingly, the quality control of the product cannot be effectively executed.

In contrast, the construction of the present invention is relatively simple and easy and avoids the problems of the prior art, such as those of the Hong publication. In particular, it is stated in paragraph [0014] of the original specification that:

The present invention makes use of a permanent magnet step-by-step motor as a basic structural unit. The direct current brushless vibration motor of the present invention is relatively simple in construction and is free of the mechanical contact between the brush and the rectifier. The control of the motor of the present invention is obtained by an electronic circuit. The motor of the present invention is cost-effective. The rejection rate of the motor of the present invention is relatively low.

In light of the absence of the mechanical contact between the brush and the rectifier, the motor of the present invention is free of electrical or mechanical noise, as well as mechanical wear. As a result, the motor of the present invention is durable and reliable.

Applicant respectfully contends that the features of the present invention, as defined herein, achieve advantages neither shown nor suggested by the Hong publication. On this basis, Applicant respectfully contends that the present invention, as defined by independent Claim 2, is neither anticipated by nor obvious in view of the teachings of the Hong publication.

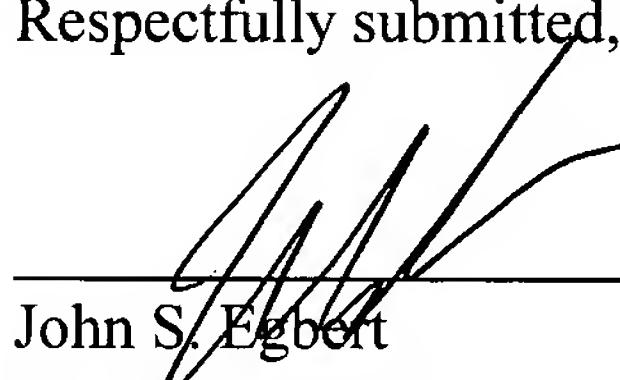
Based upon the foregoing analysis, Applicant contends that independent Claim 2 is now in proper condition for allowance. Additionally, those claims which are dependent upon Claim 2 should also be in condition for allowance. Reconsideration of the rejections and allowance of the

claims at an early date is earnestly solicited. Since no new claims have been added above those originally paid for, no additional fee is required.

Respectfully submitted,

11-8-05

Date


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